pivotal transport tower, and all CD-R disk drive heads. In the preferred embodiment, a 8031 microprocessor is used, but any 8-bit microprocessor capable of processing a command set of about 20 commands could be used.

The microprocessor receives user input generated by the software that is executed on the user's host computer. The computer software processes the user input into a set of ASCII commands sent to microprocessor via an RS-232 interface. The ASCII command set used is a variant of the Trace Mountain protocol that is often used to interface software to hardware copy devices. Commands sent by the computer software to the microprocessor consist of one letter or one letter and two digits.

Once the microprocessor is sent a command by the host computer, the microprocessor parses the command and sends an electrical signal to the pivotal transport tower.

Depending on the command sent by the computer software, the microprocessor will transmit back to the computer software a "ready" indication, an echo of the command received, or a status indication that command received was successfully or unsuccessfully executed. This status indication is then interpreted by the computer software into user readable information displayed on the host computer's video output display.

2. The Disk Spindle Members

A set of disk spindle members are located on a front horizontal deck of the copy unit. The bottom of each disk spindle member is affixed to the horizontal deck of the copy unit and projects vertically from the deck. The diameter of each disk spindle member is slightly smaller than the center hole of a CD-R disk, allowing for free vertical movement of the CD-R disk when the disk is located on the disk spindle member.

The disk spindle members are affixed to the horizontal deck of the copy unit along an arc of a circle around the axis of the pivotal transport tower. It is expected that at least two disk spindle members are affixed to the horizontal deck of the copy unit, allowing one disk spindle member to hold blank CD-R disks and the other disk spindle member to hold burned CD-R disks. The radius of the circle is selected such that CD-R disks located on adjoining spindles do not touch each other.

3. The Pivotal Transport Tower

The pivotal transport tower is centrally located in the copy unit at the radial center of the arc formed by the disk spindle members. The pivotal transport tower is cylindrically shaped, with a vertically displaceable arm projecting radially from the pivotal transport tower. Inside the pivotal transport tower is an axle along the vertical axis of the pivotal transport tower. The axle is affixed to the base of the pivotal transport tower. Connected to the axle is a first drive motor capable of pivoting the pivotal transport tower about its vertical axis. Control of the first drive motor is also supplied from electrical signals sent by the microprocessor.

An arm for a disk pickup head projects radially from the pivotal transport tower. One end of the arm is connected to a belt running vertically along the inside of the pivotal transport tower. The bottom of the belt travels around a set of gears that are connected to a second drive motor. When the second drive motor rotates the belt, the arm is raised or lowered depending on the direction of rotation of the belt.

The other end of the arm supports a disk pickup head which has a disk suction pickup unit. The disk suction pickup unit is triangle-shaped and has a circular aperture located at its apex. The diameter of the aperture is slightly wider than the diameter of a disk spindle member. Located on the underside of the disk suction pickup unit near each vertice of the disk suction pickup unit is one suction member and one rubber stopper member. A sensor also protrudes downward from the underside of the disk suction pickup unit and relays an electrical signal back to the microprocessor indicating the presence of a target disk near the disk suction pickup unit.

Additionally, during operation of the disk suction pickup unit, RAM memory located in the microprocessor or electrically connected to the microprocessor retains data for each disk spindle member corresponding to the approximate vertical distance the disk suction unit must travel before retrieving a blank CD-R disk or placing a burned CD-R disk back onto the disk spindle member.

When the disk suction pickup unit is operated, the suction members draw in air, causing the target disk to adhere to the suction members, holding the target disk horizontally against the rubber stopper members.

The size and placement of the arm and the disk suction pickup unit are chosen so that during a disk pick-up or drop-down operation the selected disk spindle member passes through the aperture as the arm lowers below the top of the selected disk spindle member.

In a typical disk transport operation, the microprocessor issues a sequential set of electrical signals that are translated into a sequential set of operations performed by the second drive motor, the first drive motor, and the disk suction pickup unit. For example, the following sequential operations controlled by the microprocessor occur when the copy unit transfers the top CD-R disk from a stack of CD-R disks surrounding a selected spindle to the data transfer unit:

- the first drive motor raises the disk suction pickup unit to a height such that all components of the disk suction pickup unit are above the top of all disk spindle members;
- the second drive motor pivots the pivotal transport tower to position the disk suction pickup unit over the selected disk spindle member, placing the aperture directly above the disk spindle member;
- the first drive motor lowers the disk suction pickup unit along the disk spindle member until the suction members make contact with the CD-R disk;
- the suction members engage and hold the CD-R disk;
- the first drive motor raises the disk suction pickup unit along the disk spindle member until the CD-R disk held by the suction members is above the top of all disk spindle members;
- the second drive motor pivots the pivotal transport tower, positioning the CD-R disk held by the suction members for transfer into the data transfer unit.

4. The Data Transfer Unit

The data transfer unit comprises two stacked disk drive receptacle members and a variable number of stacked recordable disk drive members. The two stacked disk drive receptacle members are affixed on opposite sides of the back horizontal deck of the copy unit and positioned along the arc of the circle formed by the disk spindle members at a distance greater than the diameter of a CD-R disk. Each stacked recordable disk drive member fits in a slotted receptacle member located in one of the two stacked disk drive receptacle members and is positioned on the perimeter of the circle formed by the disk spindle members, making each stacked recordable disk drive member capable of receiving a disk transported by the arm.

Each stacked recordable disk drive member sends and receives binary data with the computer software via a standard 50-pin SCSI connection between the stacked